IN THE CLAIMS:

The status of each claim that has been introduced in the above-referenced application is identified in the ensuing listing of the claims. This listing of the claims replaces all previously submitted claims listings.

25. (Currently amended) A fluorescence assay, comprising ~~the steps of~~:

providing a waveguide which is optically conductive and which has at least one surface having a plurality of capture oligonucleotides immobilized site-specifically to substantially all regions of the at least one surface having a base coating thereon, the base coating being located only on portions of the at least one surface, wherein the capture oligonucleotides have a binding site which selectively binds a selected analyte;

providing a light source operable to emit a light beam in a desired wavelength range and positioned to send light into the waveguide;

providing a detection element operably disposed to directly collect radiated fluorescence emitted from molecules located adjacent to a surface of the waveguide;

providing a sample comprising a buffer and a plurality of molecules of a selected analyte;

providing a plurality of tracer molecules which are operable to emit fluorescence in response to stimulation by an evanescent field adjacent to a surface of the waveguide;

combining the sample with the tracer molecules to produce a test solution;

placing the test solution in contact with the waveguide surface while operating the light source to direct light into the waveguide to generate the evanescent field; and

selectively and directly collecting radiated fluorescent light emitted from the tracer molecules.

26. (Currently amended) The assay of Claim 25, wherein ~~said step of~~ providing a waveguide with site-specifically immobilized capture oligonucleotides includes ~~the steps of~~:

coating the waveguide surface with ~~a first~~ the base coating to produce a coated surface;

providing a plurality of capture oligonucleotides;

modifying a single moiety which is the same on each capture molecule, to produce activated capture oligonucleotides having a modified moiety constructed to be coupled to the ~~first~~ base coating; and

treating the coated surface with the activated capture oligonucleotides under conditions to cause the modified moiety to couple to the ~~first~~ base coating and thereby immobilize the activated capture oligonucleotides to the waveguide surface.

27. (Currently amended) The assay of Claim 25, wherein ~~said first~~ the base coating is selected from the group consisting of: avidin, biotin, a hydrogel formed of polymethacryloyl polymers, and a modified polyethylene glycol.

28. (Currently amended) The assay of Claim 25, wherein an oligonucleotide primer acting as a capture oligonucleotide complementary to ~~said~~the analyte is immobilized to ~~said~~the waveguide by amine-reactive, thiol-reactive, or (strep) avidin-biotin coupling chemistry.

29. (Currently amended) The assay of Claim 25, wherein ~~said~~the tracer molecules are complementary to a second sequence of ~~said~~the analyte.